

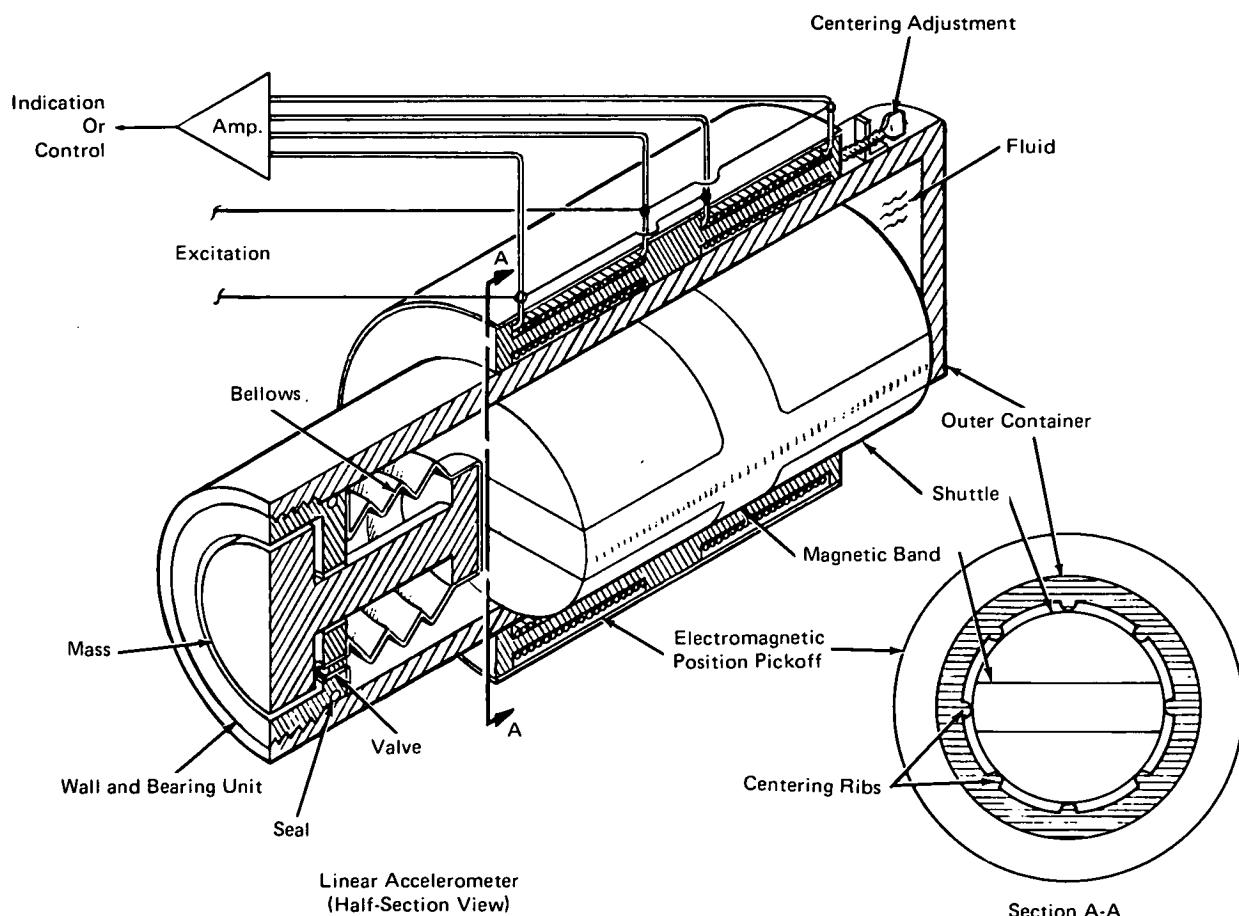
# NASA TECH BRIEF

## John F. Kennedy Space Center



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### Linear Accelerometer: A Concept



#### The problem:

A good linear accelerometer should be sensitive to small accelerations, should have a linear acceleration-to-output relationship, and should be consistently reliable. Accelerometers which meet these requirements are complicated and expensive.

#### The concept:

A design has been proposed for an inexpensive accelerometer which would work by applying pressure to a fluid during acceleration. This pressure is used to move a shuttle, and the shuttle movement is sensed and calibrated to give acceleration readings.

(continued overleaf)

## How it's done:

The proposed accelerometer is shown in the figure. A cylindrical container houses a magnetically banded shuttle. At one end of the container there is a leak-proof assembly of bellows and a weighted mass threadable into the open end of the container. An externally excited electromagnetic pick-up is placed outside of the container, but in line with the shuttle movement.

The container is of shock and chemical resistant nonmetal construction with an internal thread to accept the mass/bellows assembly. Inside the container, the shuttle is suspended in a fluid and kept concentric by means of longitudinal ribs on the container. The bellows end of the container is provided with a valve to release excess air or fluid that may be accumulated when the assembly is threaded into the container to center the shuttle on the pickoff.

When an acceleration force is applied to the mass, the bellows presses against the fluid. The shuttle then moves to compensate for the increased pressure on the fluid.

This movement is sensed by the electromagnetic pick-up. When the acceleration force is removed, the bellows, and thus the shuttle, return to their original positions.

## Note:

Requests for further information should be directed to:

Technology Utilization Officer  
Kennedy Space Center  
Code AD-PAT  
Kennedy Space Center, Florida 32899  
Reference: B72-10636

## Patent status:

NASA has decided not to apply for a patent.

Source: John Mutzberg of  
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